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OAK RIDGE NATIONAL LABORATORY
Health Physics Division

NOV 10 1952

November 3, 1952

To: J. C. Hart and A. D. Warden

From: O. D. Teague

Subject: Air Contamination Incident at Bldg. 3026-C

At approximately 8:00 A.M. on Saturday, November 1, 1952, all the blowers at the isotope area stack were shut down in order to effect the tie-in of off-gas lines from the 4500 Area. This left 3026-C without any ventilation for the hoods or the cells or any off-gas for the process vessels other than that furnished by the natural chimney draft of the stack. Stack off-gas is also used for vacuum to make solution transfers in some 3026-C cell operations. In spite of the necessity for off-gas in 3026-C operations no advance notice of the shut down was given to Chemistry. Health Physics Division personnel in 3026-C were advised at 8:02 A.M. that the shutdown was in effect when R. W. Schaich came to 3026-C to find a Health Physics man for monitoring the work to be done at the stack.

The natural chimney draft of the stack gave sufficient ventilation to prevent any rise in the level of contamination in the air at 3026-C. The Constant Air Monitors continued the gradual increase trend which had been in effect for the 15 hours previous to 8:00 A.M. and showed no increase in the rate of this trend when the fans were cut off at 8:00 A.M. However, at approximately 10:00 A.M. when the inspection plates near the base of the stack were removed the air for the chimney draft went in those openings and 3026-C had absolutely no exhaust.

At 9:05 A.M. the air activity in 3026-C showed a decided increase. The air monitor over the top of the I^{131} cell on the second level and one on the north side of the I^{131} cell on the first level both began to indicate this rise in activity. By 10:20 both of the air monitors on the second level, one of which had not indicated the first rise, showed a second rise or rather a decided acceleration in the rate of rise. By 10:27 to 10:30 these monitors indicated that the air activity on the second level was definitely greater than the maximum permissible level (MPL). A sign was posted at the foot of the stairs warning that assault masks were required for anyone going to the second level. No one was on the second level at this time.

The forced hot air blowers which have an outdoor air supply were turned on in an effort to pressurize the building and overcome the back draft from the cells. This was evidently ineffective. Ventilating exhaust fans in the north and south attics were then turned on to exhaust the activity upstairs and keep the first level safe, but these were also ineffective.

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The air monitor on the north side of the I^{131} cell on the first level was also indicating a rapid, but apparently not accelerating, rate of climb. However, by Noon, it was definite that the air activity was also greater than MPC on the first level. It may have been greater than MPC as early as 11:40. Word was passed to evacuate the building and warnings were posted at all entrances. G. R. Patterson donned an assault mask and continued to change air monitor filters and collect air samples with a midget disc type sampler.

The air sample discs indicated that the level of contamination was as high as 4.32×10^{-8} µc/cc in the main room on the first level. It was undoubtedly much higher than this on the second level. A filter from the air monitor on the second level over the I^{131} cell read 16 mr/hr after a collection time of 2½ hours. A sample collected in the machine shop, Rm. 5, showed a concentration of 2.729×10^{-8} µc/cc. The ventilation for this room is forced air from the main room; however, it is passed through fiberglass filters. At 4:00 P.M. the concentration in the main room was still 1.21×10^{-8} µc/cc or greater than MPL.

The activity concentration did not go above MPL in the hallway leading to Labs. 8, 9, 10, 11, or 12. But, there was a definite increase. An air sample showed a concentration of 7.90×10^{-10} µc/cc just outside of Rm. 9.

The 3026-C Annex Lab was not affected by the activity in 3026-C. The Annex Lab CAM remained on the 2X scale and showed practically no increase in activity level during the whole time.

Q. D. Teague

GRP:cs

cc: K. Z. Morgan
T. H. J. Burnett
G. R. Patterson
E. L. Sharp
Health Physics Shift Supervisors
Q. D. Teague - R. L. Clark